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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/322,321	05/28/1999	TONIA MORRIS	042390.P6888	7825

7590 04/20/2005

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EXAMINER	
GENCO, BRIAN C	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/322,321	MORRIS ET AL.	
	Examiner	Art Unit	
	Brian C Genco	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Applicant's arguments with respect to claims 23-35 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

So as to clarify the grounds of rejection Examiner is going to summarize what is taught by the combination of references as a whole. Berger discloses a reset shift register and a wordline shift register wherein control logic operates to implement a rolling reset. Fossum discloses to utilize the reset charge that Berger discards in order to reduce noise. Suzuki discloses that it is known to implement independent integration times of each color so as to increase the dynamic range by utilizing independent readout registers. Suzuki does this by having a global reset and then reading out each color as it completes its integration time as shown on Fig. 3. Davis discloses a functionally equivalent way of performing independent color integration times wherein each color is independently reset to begin integration at different timings and subsequently all of the colors are read out at the same time as shown in Fig. 4C. As such, given the teaching as a whole of the Suzuki reference of utilizing separate control logic for each color channel while utilizing the functional equivalent method of varying the integration time of each of the colors disclosed by Davis one skilled in the art would recognize to utilize a reset shift register of Berger for each of the colors. Examiner notes that three reset sift registers would be utilized since the reset of each color is performed independently, as opposed to the

reading out of each color being performed independently as in Suzuki, and all of the colors are read out simultaneously such that the one wordline shift register of Berger is sufficient.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 23-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 4,609,825 to Berger et al.) in view of (US PG-PUB 2003/0193597 to Fossum et al.) in further view of (USPN 4,709,259 to Suzuki) in view of (USPN 5,541,645 to Davis).

In regards to claim 23 Berger et al., herein Berger discloses an integrated circuit comprising:

a pixel array (e.g., see Fig. 1);

a first reset shift register having a plurality of outputs, each output being coupled to control a reset of sensor elements that are in a respective one of the rows of the array (e.g., element 4 of Fig. 1);

a wordline shift register having a plurality of outputs, each output being coupled to control a readout of all of the sensor elements that are in a respective one of the rows of the array (e.g., element 5 of Fig. 1);

control logic coupled to feed (a) the first shift register with a reset bit and (b) the wordline shift register with a read bit, and to operate the reset and wordline shift registers so that the reset bit and the read bit shift through their respective registers while an image frame is being captured, with the reset bit always being one or more rows ahead of the read bit to mark the start

of integration, wherein the control logic is to program the reset bit and the read bit to set the integration time independently for different lines (e.g., column 4, lines 24-30 and 52-60; column 5, lines 14-27; Fig. 2).

Berger does not disclose that the reset bit is used for generating a correlated double sampling (CDS) reset value. In contrast, Berger discloses draining the reset charges (column 4, lines 24-30 and 52-60). It is extremely well known in the art to use the reset bit in order to generate a CDS reset value as taught by Fossum et al. Fossum et al., herein Fossum, discloses sampling a reset voltage at the end of integration in order to reduce various noise introduced into the signals (paragraphs 0028, 0029, and 0033).

Neither Berger nor Fossum disclose a color sensor array having a plurality of sensor elements of different first and second colors, arranged in rows and columns, wherein the first reset shift register is used to control the integration time of the first color and a second reset shift register is used to control the integration time of the second color.

Suzuki discloses a color image sensor wherein the integration time for each color is adjustable so as to increase the dynamic range of the sensor (column 2, lines 17-21). This is accomplished by having separate registers for each color so as to reset all of the colors at the same time to start the integration period and to read out the colors at their respective integration times as depicted in Fig. 3 (e.g., column 4, lines 6-41; column 5, line 27 – column 6, line 16); Figs. 1-3). Therefore it would have been obvious to have had the integration time for each color is adjustable so as to increase the dynamic range of the sensor. As such, for at least the red and green colors two reset bits would be needed, one to mark the start of integration as taught by

both Berger and Suzuki and the other to perform CDS at the end of the integration period as taught by Fossum.

Examiner notes that Suzuki discloses to set the integration time for each color independently by using the second reset bit. Examiner asserts that utilizing the second reset bit to vary the integration time as disclosed by Suzuki in Fig. 3 is functionally equivalent to utilizing the first reset bit to vary the integration time wherein it is well within the level of one skilled in the art at the time of the invention to have selected any of these functional equivalents. Evidence of this functional equivalence is found in the previously relied upon USPN 5,541,645 to Davis in Fig. 4C. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have varied the integration time of the colors with the first reset bit instead of the second reset bit since they are functional equivalents of each other and it is well within the level of one skilled in the art to select either of the equivalent methods for varying the integration time of the different colors. As such, given the teaching as a whole of the Suzuki reference of utilizing separate control logic for each color channel while utilizing the functional equivalent method of varying the integration time of each of the colors disclosed by Davis one skilled in the art would recognize to utilize a reset shift register of Berger for each of the colors. Examiner notes that three reset sift registers would be utilized since the reset of each color is performed independently, as opposed to the reading out of each color being performed independently as in Suzuki, and all of the colors are read out simultaneously such that the one wordline shift register of Berger is sufficient and controls the readout of all of the sensor elements in a respective row.

In regards to claim 24 see Fig. 1 of Suzuki.

In regards to claim 25 see examines notes on the above rejections. Note that the combined teaching of Berger, Suzuki, and Davis teach to have a reset shift register for each color. Note further that Suzuki discloses using the Bayer color filter wherein all three colors are present on any one given line. As such, one of ordinary skill in the art would recognize that three reset metal lines would be used for each row. As such there are two reset metal lines for each row.

In regards to claim 26 see Examiners notes on the rejections above. Examiner notes that it is known in the art that in conventional lighting the blue color typically has the lowest intensity thus has the longest integration time. Davis discloses that since this is the case, in order to have a time efficient image sensor, and minimize dead time one would only want to reset the blue color once (e.g., column 5, line 26 – column 6, line 7). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have only had one reset for the blue reset register, or third reset register, in order to minimize dead time and thus have a time efficient image sensor.

In regards to claim 27 see examines notes on the above rejections.

In regards to claim 28 see examines notes on the above rejections.

In regards to claim 29 see examines notes on the above rejections. Note that the combined teaching of Berger, Suzuki, and Davis teach to have a reset shift register for each color. Note further that Suzuki discloses using the Bayer color filter wherein all three colors are present on any one given line. As such, one of ordinary skill in the art would recognize that three reset metal lines would be used for each row. As such there are two reset metal lines for each row.

In regards to claims 30-35 see Examiners notes on the rejections above.

Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 4,609,825 to Berger et al.) in view of (US PG-PUB 2003/0193597 to Fossum et al.) in view of (USPN 4,709,259 to Suzuki) in view of (USPN 5,541,645 to Davis) in view of (USPN 3,971,065 to Bayer).

In regards to claim 36 see Examiners notes on the rejections above. Examiner notes that none of Berger, Fossum, Suzuki, nor Davis disclose that even-numbered rows of the array contain alternating elements for the first and the second color and odd-numbered rows of the array contain alternating elements for the first and the third color. Examiner notes that Suzuki does disclose a Bayer color filter array as shown in Fig. 1. Bayer discloses a color filter array pattern shown in Fig. 1B wherein this pattern provides for the luminance-sensitive elements to have the highest element population while providing a pattern that enables sampling of an image for all three basic color vectors to be symmetrical and uniform in two orthogonal directions (column 3, line 55 – column 4, line 2). Therefore it would have been obvious to have utilized the Bayer color filter array pattern shown in Fig. 1B of Bayer, wherein the luminance element Y is green, the first chrominance element C1 is red, and the second chrominance element C2 is blue, so as to provide for the luminance-sensitive elements to have the highest element population while providing a pattern that enables sampling of an image for all three basic color vectors to be symmetrical and uniform in two orthogonal directions.

In regards to claim 37 note that since an entire row is being read out by the wordline shift register then the signal of the first color and one of the second color and the third color are output.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached by phone at 571-272-7364 or by fax at 571-273-7364. The examiner can normally be reached on Monday thru Friday 8:30am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Groody can be reached at 571-272-7950. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the customer service office whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian C Genco
Examiner
Art Unit 2615

April 13, 2005

TUAN HO
PRIMARY EXAMINER